



Call for an IVS Office for Outreach and Communications (OOC)

– Axel Nothnagel, University of Bonn

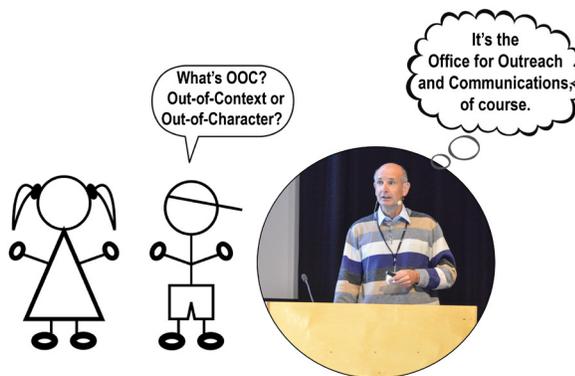
On July 9, 2018, the IVS Directing Board issued a call for proposals for an IVS Office for Outreach and Communications prompting all IVS components and associates to consider taking over a very important task in the structure of the IVS. Hopefully everybody in the IVS has noticed this call.

From your own experience, you will know that Global Change is mentioned everywhere and that exciting results describing the changes are gladly attributed to some bodiless entity of global geosciences but mostly to those who have a well working public relations section. However, monitoring results such as precise global coordinates and their time evolution are found on the Web page of the International Terrestrial Reference Frame, and a similar situation exists for the Earth orientation parameters which are needed for computing the Earth-fixed ephemerides of all navigation satellites. They are just said “to come from the International Earth Rotation Service.” You see already where this leads to: the IVS with its associates, investments, and endeavors is nowhere to be found.

Apparently, the IVS in its current composition has never been very successful in conveying what it is actually able to provide and where it makes indispensable contributions. For this reason, we like to strengthen this part of the IVS’s operation by establishing an Office for Outreach and Communications (OOC), which

shall be visible externally and well accepted as a contact point internally. In this context, the tasks of the OOC in the first place consist of devising and maintaining an attractive and informative Web presence. Furthermore, we consider outreach arrangements with other organizations (e.g., IAG, IAU, IERS) a very important duty to strengthen our publicity within all of those groups that we cooperate with and that provide similar services. Also missing are flyers and other information material on the technique of geodetic and astrometric VLBI and on the achievements of the IVS for scientific colleagues, political decision makers, and the general public.

I am pretty sure that there are young colleagues among us who would love to showcase their Web design skills with such an important task as the IVS OOC. Designing flyers or populating social media with interesting content might also be one of your favorite hobbies. If you are not sure how to proceed, what is expected, and what efforts are required, please contact the IVS Chair, Axel Nothnagel (nothnagel@uni-bonn.de), and/or the Director of the Coordinating Center, Dirk Behrend (dirk.behrend@nasa.gov). The official deadline for proposal submission is August 31, 2018, but any contact with us concerning these activities is certainly also very welcome thereafter. The tasks of an OOC are quite rewarding both for your own standing but also for that of the IVS. So, please consider this call under multiple aspects.



Exercise your privilege!

Nominate and vote in the IVS Elections in the fall of 2018. For more details see page 8.

From the Editors

At its recent meeting in Longyearbyen, the IVS Directing Board decided that the electronic version of the IVS Newsletter would be sufficient. The Board felt that a printed copy no longer serves any particular purpose and not printing and distributing the copies would help saving the planet. Thus, from Issue #51 onward you will only receive the PDF file of the Newsletter. We will continue to prepare three issues per year in the months of April, August, and December. We will adhere to the same format; the only difference is that there will be no paper version distributed. So, please continue to stay with us and enjoy the color version online.

– Dirk Behrend

PMD – The Other AC in Milan



Vincenza at the Eighth IVS General Meeting in Shanghai, China.

When you hear about an AC in Milan, your first association is likely to be with a soccer club. In the IVS world, however, it has a different meaning: it relates to the Analysis Center at the Politecnico di Milano. The city of Milan is located in northern Italy in the Po river valley not too far from the foothills of the Alps. Milan is the capital of the Lombardy region. The AC is tightly knit to the name of Vincenza Tornatore. Newsletter editor Hayo Hase performed an e-mail interview with Vincenza; in the process, he learned interesting tidbits about the AC and its activities as well as about the work of the CRAF committee and its implications for VGOS.

Vincenza, you are the head of the IVS Associate Analysis Center (AC) at the Politecnico di Milano DIIAR (PMD). Polimi is a large university with more than 42,000 students: where is PMD located and when did it become an AC?

The IVS AC started officially in the beginning of December 2010. The name of the AC was “Politecnico di Milano DIIAR” (PMD), where DIIAR was the acronym for the Department where I worked at that time. But all of the



Part of the group belonging to the research area “Geodesy and Geomatics” on the terrace of Building 3. (First row, from left) Dr. Ing. C. De Gaetani, Indian visiting student, Ecuadorean visiting PhD student, Mr. M. Spagnoli, Dr. Ing. L. Rossia, and Mr L. Pallottino; (Second row, from left) Prof. F. Migliaccio, Mrs E. Raguzzoni, Dr. Ing. G. Minini, Italian PhD student, Dr. Ing. N.E. Cazzaniga, Prof. A. Albertella, Dr. V. Tornatore, Prof. R. Barzaghi, Dr. G. Sona, Mrs. C. Vajani, and Ing. D. Passoni.

departments of the university were re-organized in 2013 and now the name of the department is DICA, which stands for “Dipartimento di Ingegneria Civile e Ambientale.” The AC PMD is part of the Research Area of DICA called “Geodesy and Geomatics” (<http://www.dica.polimi.it/en/>).

The laboratory is located on the first floor of Building 3 of the Milano Leonardo campus. Leonardo campus is the oldest of the Politecnico di Milano campuses; it was inaugurated in 1927 at the buildings on the Piazza Leonardo da Vinci.

How many members does the AC have? How many students learn about VLBI and in what context?

The number of people and level of involvement in the AC PMD work have varied over time. For example, Mrs. C. Vajani worked for the AC since the beginning, while Dr. Ing. L. Cannizzaro and Dr. Ing. N. Cazzaniga collaborated with the AC for several years. When the latter two left for jobs outside of the University, other colleagues such as Dr. Ing. L. Rossi supported the AC (software maintenance in particular) and Ing. (PhD student) D. Passoni is also beginning to collaborate. The number of students that attend seminars on geodetic VLBI has been about fifty per year. They are students of the school now called “School of Civil, Environmental and Land Management Engineering” attending courses on geodesy, positioning and monitoring techniques, and surveying and adjustment theory.

As an Associate AC you are not involved in the regular data production, but you are investigating special research subjects. What have you been working on?

Initially, the main activities concerned the processing of the EUROPE sessions and studying the effects of radio source structure on estimated baselines. Then I intercompared for a long time European geodetic products from VLBI and other space-geodetic techniques that contribute to the ITRF. During and after my PhD at Politecnico di Milano (1998), I looked deep into many statistical and mathematical methods useful for data processing such as cluster analysis, Kalman filtering and smoothing, collocation, Bayesian approaches, and time series analysis. Many research activities have been dedicated also to designing observational VLBI experiments, writing proposals to get observing time at radio telescopes, coordinating technical staff at the radio telescopes (in particular at the four Italian sites), and carrying out experiments that were dedicated to the so-called sky co-location by observing GNSS satellites and the Chang'E-3 lander.

What would you like to investigate in the future?

I would like to continue to compare VLBI products with those from the other space-geodetic techniques, use different approaches to look for common signatures, and investigate systematic effects in residual time series. I would also like to deepen studies on troposphere and ionosphere effects on geodetic products. We will be looking into organizing further VLBI observing campaigns for positioning moving objects in space with the highest possible accuracy. We want to collaborate with the Italian VLBI stations and ACs to perform local surveys to assess gravity-induced deformations and to (re-)determine local ties, as was recommended at the 10th IVS GM. In the recent months, however, my main concern for the future is to individuate strategies and initiatives to preserve VLBI frequencies and VGOS broadband reception from emerging occupations of the VLBI spectrum by external active Services.

In September 2013, you became also the secretary of the Committee on Radio Astronomy Frequencies (CRAF). Can you tell us a bit about CRAF?

CRAF is an expert committee of the European Science Foundation (ESF), acting on frequency issues for European radio astronomy and related sciences. CRAF provides a single European voice on frequency protection for its Member Institutions. The mission of CRAF is to keep the frequency bands used for radio astronomical observations free from interference and keep available continued access to the radio spectrum for radio astronomy; and also, to support related disciplines observing radio frequency bands for passive use; e.g., remote sensing.

At present, CRAF has members from more than 20 European countries (and South Africa) in the International Telecommunication Union Region 1 (ITU-R1). Also the scientific organizations of ESA, IRAM, and IVS are CRAF members.

Given that all CRAF documents pass your desk and that you are aware of the VGOS developments of the IVS, do you have any concerns for the future of geodetic VLBI?

During my time as CRAF Secretary I have witnessed the growth of radio frequency interference (RFI) experienced in various countries, because new upcoming systems operate within the same radio frequency band, or because of out-of-band or spurious emissions. These detrimental or disturbing signals affect not only protected radio astronomy frequencies but also parts of the spectrum used by geodetic VLBI or intended to be used by VGOS. Many of the new services are mostly devoted to global Internet and mobile telephones; they are going to use base stations on the Earth (e.g., 5G) and/or thousands of broadband satellites. They are active services broadcasting huge power signals in the same bands planned for VGOS telescopes. All this is happening while, on the one side, not all of the VGOS community is fully aware of the danger that these services represent for the future of this technique and, on the other side, the administrations are not aware of the vital role of the VLBI/VGOS technique for the determination of ITRF, ICRF, and EOP (in particular UT1). UT1 is necessary for satellite and space missions; therefore, all geosciences and space sciences are involved in these problems.

Have you thought about a future scenario of how to do geodetic VLBI in the presence of emerging commercial services using the radio window? What should a radio telescope station do in order to conserve good conditions for VLBI observations?

The scenario in the future could become really unmanageable. Thousands of satellites could fly over the VGOS telescopes broadcasting very strong signals in the same broadband range in which the VGOS system wants to observe very weak signals from very distant natural radio sources. We have to look for solutions that have technological, commercial, and political aspects.

Technical precautions are very important to defend VLBI observations against detrimental RFI and to avoid big data loss. Among them are high dynamic ranges with switchable filter banks to mitigate RFI, notch filters at front end, adjustments of elevation mask not to pick up ground transceivers level, and the construction of passive RFI barriers.

It is also important that each new VGOS radio telescope is registered at ITU to have at least the radio astronomy frequencies protected (in spite of their narrow bandwidths). In this way each telescope can have at least a voice at international meetings where new frequency allocations requested by commercial services are discussed.

The IVS and VGOS community already has support from one UN resolution (26.02.2015), one EU directive (14.03.2007), and the ITU-R TF.460 recommendation on the importance of VLBI reference frame infrastructure and of UT1. To assert these acknowledgments and to defend the VGOS frequency bands as soon as possible the challenge for IVS, GGOS, IAG, IUGG, Earth sciences, and Space sciences directing boards or official representatives would be to look for initiatives at high directing levels in ITU. It will be a lengthy process to follow standard procedures for negotiating VGOS bands free from RFI or to ask for new allocations for VGOS. The sooner we start, the better. VGOS is risking that its voice will not be heard, once the bands of interest are occupied by very aggressive commercial competitors. Many projects from private companies are already on the agenda and they will not accept to collaborate to find ways to reduce, remove, or prevent interference to VGOS, once they have spent lots of money to design or realize their projects.

Besides working for Polimi, IVS, and CRAF, what do you do in your leisure time?

My free time is very limited on working days. When possible, during the weekends or holidays, I like going to places on the sea or walking in the mountains. But I have to say that most of my leisure time during the past 16 years has been dedicated to growing the next generation of possible 'Earth Scientists' or possible 'classical orchestra Musicians.'



Vincenza and F. Colomer at the 10th Working Meeting on European VLBI for Geodesy and Astrometry, Matera, May 1995.



Vincenza's daughter Eleonora at a billboard of the EGU 2007. She was registered in the 'Child Care of the Austria Center' at the General Assembly 2007 of the European Geosciences Union (EGU), 16-20 April 2007, in Vienna.

A Ten for the Tenth

– Dirk Behrend, NVI, Inc.

In the first week of June the IVS held its 10th General Meeting in Longyearbyen, Svalbard. Some one hundred participants from around the world came together on this Norwegian archipelago in the High Arctic to share information, to plan future activities, and to interact with members of the VLBI and Earth Sciences communities. At roughly 78°N and with some 2,500 inhabitants, Longyearbyen is the world's northernmost town and the capital of Svalbard, which means “cold coast” in Old Norse.



Participants of the General Meeting at the bust of Roald Amundsen in the center of Ny-Ålesund.

Due to the Arctic location, the meeting had to be organized in early summer and not in the typical IVS GM months of February or March. While this did not allow us to experience the northern lights, it set us up to enjoy the midnight sun for the entire meeting—you may say that the sun did not set on the IVS. In terms of temperature, we were right on cue with the thermometer hovering around 0–2°C for most of the time.

On Sunday, June 3, the meeting started out with the icebreaker reception in the Radisson Blu Polar Hotel. While not all of the slightly more than 100 registrants had arrived yet—some decided to arrive on the 2:00 am flight on Monday—, the attendant crowd enjoyed the treats served and took full advantage of the opportunity to have personal conversations with their peers. With the backdrop of the mountains on the other side of the fjord, the opening words of Per Erik Opseth and Axel Nothnagel made us all fully aware that this meeting was actually happening. An unexpected surprise was the appearance of Santa Claus and his companion in the registration area. It seems that Chris Jacobs found his true calling. Well done, Svalbeard!

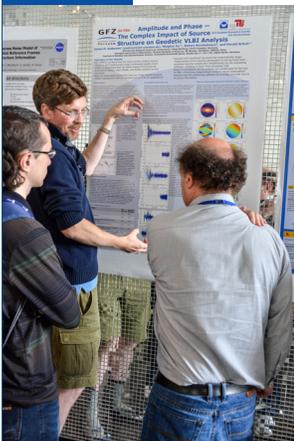
The GM proper then took place over the course of the next four days in the culture house (“Kulturhuset”), a five-minute walk from the Radisson. The exception was Wednesday, when we did something completely different—but I will come to that a bit later. The GM was run under the theme “Global Geodesy and the Role of VGOS – Fundamental to Sustainable Development.” To reflect this, the Opening Session included a 30-minute video by a Norwegian documentary filmmaker about the importance of global geodesy for the world as well as a keynote speech about the UN-GGIM initiative on the Global Geodetic Reference Frame by IAG Vice-President Zuheir Altamimi. This was followed by five scientific sessions covering the full spectrum of VLBI activities supported by the IVS.

The scientific program encompassed 96 presentations. Almost two thirds of them were given as oral presentations (62), leaving one third for poster presentations (34). The distribution in favor of talks has been a hallmark feature of the IVS GM and is in stark contrast to major assemblies such as the AGU and EGU meetings, where posters are the prevailing presentation type (about 70%). In Longyearbyen it was thus ensured that most of the young scientists could present orally.

Each oral session was led by two chairs. Pablo de Vicente and Weimin Zheng presided over the talks dealing with the progress of the VGOS network, while Chet Ruzsczyk and Alexander Neidhardt chaired the VGOS technique and observations presentations. This was followed by Evgeny Nosov and David Hall leading through talks about legacy S/X and mixed legacy/VGOS operations. The longest session with talks about VLBI core products and their improvements was managed by Dan MacMillan and Minghui Xu. And, finally, the future-looking session on extending the scope of VLBI usage/applications was headed by Lucia McCallum and Takahiro Wakasugi. Due to the very busy general program the oral sessions started rather early (8:00 or 8:30). This allowed to wrap up the scientific program of each day before 18:00, making room for subsequent evening events such as the visit of the SvalSat facilities.

The dedicated poster session itself was held during the second presentation block of Tuesday afternoon. It had an interesting setup in the sense that the posters were spread over several rooms of the Kulturhuset: parts were in the lecture hall, others in the café area downstairs as well as upstairs, and some in the aisles in between. With this large spread, it was decided to pool the posters of the same presenter into the same area, even if they were part of different sessions. The biggest beneficiary was clearly Christian Plötz who had the Herculean task of tending to six posters at the same time.

The overall quality of the presentations was very high. A clear testament to the usefulness of the General Meeting as a knowledge exchange for all matters VLBI. While the attendance level was not as high as with the previous few GMs,



James Anderson (center) discussing source structure impacts with Alexander Plavin (left) and Patrick Charlot (right) during the poster session.

the turnout can nonetheless be considered excellent given the remoteness of the location and the associated relatively high travel costs. It was also good to see a number of new faces, which is important for the future of the IVS.

As already indicated earlier, on Wednesday we did another first for an IVS GM: we undertook a boat excursion from Longyearbyen to Ny-Ålesund in order to inaugurate the new Earth observatory there. This was not a trifle as each sailing was anticipated to take five hours; so, we would be ten hours at sea. Being in Arctic waters, it was a going concern how the weather would turn out on the day of the excursion. It is unclear to me how they did it, but our local hosts were able to convince the Old Norse gods (I assume Aegir) to come up with a splendid day for the excursion. Well, there was some minor lapse. At any rate, unlike the previous days we had blue skies and quite calm waters for most of the day. Solely a one-hour stretch before entering Kongsfjord (where Ny-Ålesund is located) we ran into a bit of a swell from the open ocean. Other than that people were out and about enjoying the Spitsbergen scenery of snow-capped pointed peaks, glaciers, and blue waters. Special treats were a walrus colony stopover and a helicopter rescue training exercise.



The catamaran "Aurora Explorer" used for the boat trip from Longyearbyen to Ny-Ålesund. In the background notice the only campsite in town and the runway of Longyearbyen airport.

For the inauguration of the new twin telescopes we were transported from the town pier to the outlying observatory site using every available car in town. At the perimeter around the site, polar bear guards were standing watch with their rifles shouldered. Luckily, we had no uninvited visit from the King of the Arctic. That was not necessarily a given considering that there are roughly 3,000 polar bears that call Svalbard their home—more bears than people living on the archipelago. After the short official ceremony and a visit of the facilities, festivities were continued indoors at the main cafeteria building of Ny-Ålesund. Following a short sight-seeing break, it was time to head back to Longyearbyen. The second crossing was very smooth and everyone enjoyed the ride, letting the spectacular landscape pass by in awe. Making dock after midnight, we were experiencing the midnight sun from aboard ship.

The GM itself was closed out on Thursday with the official banquet in the Kulturhuset. The evening was enlivened with the performance of a local choir as well as the telling of a coal miner's story. As a special treat the local hosts gave out certificates of appreciation to those with "special accomplishments." This included the winner of the photo contest on Twitter, the most seasick person, or the person who forgot her poster the most times on the way to Longyearbyen. I think you get the gist of it. Beyond the GM, there were also several splinter meetings held: a VGOS Technical Committee meeting, the IVS Analysis Workshop (see separate article), a Southern Hemisphere Astrometry Team meeting, and an IVS Directing Board meeting.

I'm sure that I speak for everyone in saying that the meeting deserves a "10" and that we will keep fond memories of the events for a long time. I would like to thank our local hosts from the Norwegian Mapping Authority to make that all happen. Tusen takk!

The next General Meeting will be held in Annapolis, Maryland, USA in the week of March 22–28, 2020. The Goddard VLBI Group is looking forward to welcoming you to the 11th installment of the GM and hopes to see many of you on this side of the great pond.



Per Erik Opseth (right) introduces the members of the LOC to the meeting participants.



One of the twin telescopes at Ny-Ålesund with the jagged Tre Kroner (Three Crowns) peaks in the back during the inauguration event.



Walrus colony at Poolepynten on Prins Karls Forland.

A Brief Summary of the Analysis Workshop in Longyearbyen

— Lucia McCallum, University of Tasmania and Dan MacMillan, NVI, Inc.



Lucia McCallum during a talk at the General Meeting.

It is a tradition that the annual Analysis Workshop takes place as part of the yearly geodetic VLBI convention; this year the workshop was a part of the IVS General Meeting in Svalbard. As our Analysis Coordinator John Gipson was unable to travel to Longyearbyen, Lucia McCallum led the discussion. On the morning of Friday, June 8, some 40+ attendees assembled to discuss VLBI analysis, give updates on their developments, learn about common procedures, and decide on future actions.

A lively workshop evolved, and the scheduled three-hour window unfortunately turned out to be too tight for all

items on the agenda to be dealt with properly.

In our fast-paced world, the IVS analysis community is no different: the suggested agenda items exponentially increased literally days to hours before the workshop. For an overview, the agenda, minutes, and presentations are all available online on the Analysis Coordinator's Web site at https://vbi.gsfc.nasa.gov/IVS-AC_analysis_workshops.htm.

It was a pleasure to see that more and more geodetic analysis software packages are working towards including processing of data from VLBI and the other geodetic techniques. However, most of the packages begin VLBI processing at the ambiguity-resolved group delay level (Level-4 database). This was identified as a weakness for the overall VLBI analysis. On the other hand, there are more groups now beginning processing at the correlation, fringe fitting and intermediate stages of processing. While this was considered a great development, it was acknowledged that more coordination, communication, and alignment of best practices were needed to assure consistency of our results. Proactive IVS analysts can help to achieve this goal, by communicating current issues and best practices to the correlators and to stations, which is information that could then be maintained by the Analysis Coordinator.



Santa and Frau (Mrs.) Claus appearance in Longyearbyen.

Besides routine business, topics like the transition to vgosDB, the prospect of a correlator comparison campaign to investigate differences in processing between correlators, and the upcoming ITRF2020 (Zuheir Altamimi told us to expect a first call for participation by

the end of this year) were the most exciting ones. To meet the ITRF2020 schedule, John Gipson sent a list of software modifications that need to be made, which include antenna gravitational deformation, galactic aberration, a new HF-EOP model, the IERS linear mean pole model, a pressure loading option that includes the applied loading correction separately in Sinex files, and source position and nutation information in Sinex files.

In addition to the software work, action items from the workshop include (1) the possibility of Analysis Centers submitting Intensive sessions to the IVS Combination Center to generate an Intensives combination product, (2) the enhancement of the correlator coordination with bi-monthly correlator meetings, and (3) the need of a database of cable delay signs for legacy sessions. Other topics like sensitivity issues in 2-bit sampling that did not work correctly for many stations in R1s with the higher bit rate, source structure effects, or phase calibration unfortunately had to be cut short because of time limitations.

The IVS Newsletter is published three times annually, in April, August, and December. Contributed articles, pictures, cartoons, and feedback are welcome at any time.

Please send contributions to the General Editors (see below).

The editors reserve the right to edit contributions. The deadline for contributions is one month before the publication date.

General Editors: Dirk Behrend (Dirk.Behrend@nasa.gov),
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The newsletter is published in color with live links on the IVS web site at

<https://ivsc.gsfc.nasa.gov/>.

Upcoming Meetings...

12th DiFX Meeting Wetzell, Germany September 3-7, 2018	3rd AOV Meeting Canberra, Australia November 9-10, 2018
14th EVN Symposium Granada, Spain October 8-11, 2018	7th Int'l VLBI Tech WS Krabi, Thailand November 12-15, 2018
SciDataCon-IDW 2018 Gaborone, Botswana November 5-9, 2018	AGU Fall Meeting Washington, DC, USA December 10-14, 2018

<https://ivsc.gsfc.nasa.gov/meetings>

The Case for Starting VLBI Sessions at 0h00 UT

– Axel Nothnagel, University of Bonn

Revisiting earlier discussions, the issue of changing the start times of the 24-hour sessions to 0h00 UT on all days was officially brought up again and discussed intensely at the last meeting of the IVS Directing Board in Longyearbyen on June 9, 2018. Lacking a quorum in the meeting, the final decision on this topic was postponed to a later time. Currently, scientific arguments and organizational restrictions are being collected by the Board to have a better basis for a decision. Nevertheless, my personal standpoint is that the IVS should change to 0h00 UT start times from January 2019 onward—and I provide supporting arguments below.

In the era of high-precision geodetic VLBI observations, the start times of 24-hour sessions have always been at about 18h00 UT. The reason for this is a historical one, originating from the first trans-Atlantic sessions (e.g., IRIS-A, CDP) and the early VLBI networks for regular EOP determinations predominantly having been centered about the Atlantic. Because this time of the day is quite convenient for a number of sites and old habits die hard, the 18h00 UT start times have survived for the last 33 years.

However, considering modern developments of combining the VLBI results with those of other space-geodetic techniques (SLR, GNSS, or DORIS), which all use the 0h00 UT session boundaries, for a long time there have been requests to harmonize the session start times of geodetic VLBI sessions to 0h00 UT. These were made not only by colleagues outside of the IVS but also on the inside for more reasons than just combining the results with the other techniques.

My personal view is that start times at 0h00 UT is the way we have to go. The 0h00 UT start was used successfully in the last several CONTs, and all VGOS sessions will automatically be structured according to the 0h day boundaries preparing for 24/7 operations. A change will likely impact working hours and shift schedules at the stations; however, as the IVS stations cover all geographic longitudes, there are currently stations that have night-time starts. In the future scenario, this burden would shift to stations with local time zones that are close to 0h00 UT. If practical, sessions could be prepared beforehand and run in unattended mode to the extent possible.

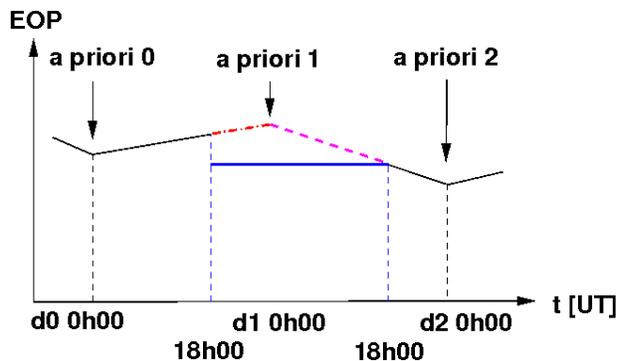
To make this change, I propose that the R1 sessions in fact become R2s starting at 0h UT on Tuesdays (Tuesday in Australia and Japan, and still Monday at Kokee) and the R4s become R5s ending at 0h00 UT on Saturdays (Saturday morning in Australia and Japan, and still Friday at Kokee).

In the second part of this write-up, I would like to turn to the combination and the analysis as arguments for 0h00 UT start times. In the combination process with the results of other space-geodetic techniques, the VLBI products have never been fully compatible. As a consequence, the

VLBI results always lost part of their accuracy through the need for interpolation. What is even more important in genuine VLBI data analysis is the handling of the *a priori* EOP, which are always tabulated at 0h00 UT. For each single scan, this entails an interpolation step and there are serious limitations to the procedures used today.

If we look at a generic EOP *a priori* interpolation scheme (see Figure), we see that for the scans between 18h00 and 24h00 UT the *a priori* value is interpolated from the 0h00 (Day 0) UT and the 0h00 (Day 1) UT values (red/dash-dotted section), while for the second period from 0h00 UT to 18h00 UT the interpolation utilizes the values of 0h00 (Day 1) UT and 0h00 (Day 2) UT (magenta/dashed section). Because the three *a priori* values do not necessarily produce a straight line in 0h00 (Day 1) UT, the interpolations can introduce spurious effects into the estimated EOP. Furthermore, the two linear segments lead to two different EOP rate segments and a singularity in differentiation at 0h00 UT. The latter inhibits an unambiguous computation of the EOP rate *a priori*, which is unreproducible in the combination process. And, finally, the *a priori* EOP offsets and rates have never been consistent.

A session start time at 0h00 UT would overcome this problem quite easily, because the *a priori* EOP and (especially) EOP rates for every scan can quite easily and unambiguously be interpolated from just two values at 0h00 UT. As an aside, it should be mentioned that eventually all analysts should actually estimate and report the EOP at the two epochs at the beginning and the end of the session. The two values of a polygon then automatically include the rate information, allow for a better way of doing proper combinations, and open more possibilities for an easier exploration of EOP estimates at higher time resolution.



Interpolation scheme for *a priori* EOP.

Directing Board Elections Are Coming!

– *IVS Election Committee (Gino Tuccari, Francisco Colomer, Arthur Niell)*

We are living during an exciting time at the IVS as the VGOS network is being deployed, and our community faces new challenges. Important decisions are constantly being considered to coordinate the developments in observational requirements, equipment, analysis procedures, strategy, and governance of our growing global community in order to ensure that the goals of IVS are fulfilled. In this context the upcoming Board elections at the close of the year have an elevated importance. After two years it is time for the next IVS elections in order to get prepared for the next two-year period, which will begin in February 2019.

For the next governing period, seven positions need to be filled in the Representative and At-Large areas. In the Representative category the positions to be renewed for the next four years are: one of two Network Representatives, the Correlator Representative, one of two Analysis Center Representatives, and the Technology Development Representative. In addition to these, the three At-Large positions are to be elected for a two-year term.

The elections have an important phase that is devoted to nominating the candidates. In this phase IVS members who are eligible to be elected have to be proposed. This part of the election process will take place in October 2018 in order to be ready for the actual elections which will be divided into two parts: Representative elections (voting by the Associate Members) in November 2018 and then, about one month later, At-Large elections (by the Directing Board). The At-Large members are selected with the aim to balance out the Board as wide and best as possible.

The positions to be filled are (including incumbents):

- four Representative positions with four-year terms:
 - one Network Representative (currently held by Torben Schüller)
 - the Correlator Representative (currently held by David Hall)
 - one Analysis Center Representative (currently held by Arthur Niell)
 - the Technology Development Representative (currently held by Thomas Hobiger)
- three At-Large positions with two-year terms (currently held by Evgeny Nosov, Takahiro Wakasugi, and Guangli Wang).

Both Thomas Hobiger (Representative position) and Guangli Wang (At-Large member) cannot be re-elected. Thomas is vacating the TDC position early (after less than two years), because he is leaving the IVS/VLBI world, accepting the call to full professor at the University of Stuttgart (which is not affiliated with the IVS). Guangli is maxed out, because he already served two consecutive terms on the Board.

The Election Committee will prepare and distribute a call for nominations by October 2018. The IVS community should begin preparing to nominate their favorite candidates and take part in the decision process. Take into account, though, that any nominee must be an IVS Associate Member. So, be sure to get in contact with the Coordinating Center if your choice is not currently listed as an IVS Associate Member.

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